THE WEATHER WHISPER

Spring 2013

NWS Des Moines Hosts Decision Support Services Workshop

by Mindy Beerends, General Forecaster

In mid-January NWS Des Moines hosted a Decision Support Services Workshop, with a second workshop postponed until late April due to a winter storm in late February. Many officials from the central Iowa emergency management community and one first responder were in attendance at the first workshop with several more core partners registered for the second. The workshop focused on the partnership between the National Weather Service and the emergency management community and how we can work together to provide life-saving information during hazardous weather situations.

Decision Support Services (DSS) consist of the NWS Des Moines becoming part of a team of decision makers and providing concise interpretation of weather data in a fast, reliable and accurate manner to the core partners such as the emergency management community. The primary goal of the services would be to provide focused support to the decision makers for high impact events, emergencies, or disasters where weather is a factor in the decision making. The service and support could be performed on-site such as at the Iowa State Emergency Operations Center (EOC) or remotely via the internet or telephone.

The workshop discussed both current and future DSS activities both here at the NWS Des Moines office and throughout the NWS as a whole. Some of the current services provided by the NWS Des Moines are partner webinars prior to major events, web briefings prior to high-end events, special event support, post-event services such as storm damage surveys, staffing of the State EOC when needed, state agency briefings and training. Over the past 20 years, NWS Des Moines has had to provide DSS to the State EOC nine times for a variety of activations. The past three activations involved virtual support since the events have been of long duration. Training opportunities have consisted of annual storm spotter training presentations and, new for 2013, a webinar training series for emergency managers and first responders.

Communication is intricately woven throughout the process and NWS Des Moines uses many different types of communication to interact with core partners and the public. These include a range of communication types such as the telephone, NOAA Weather Radio, amateur radio, and an 800 MHz radio and newer avenues such as internet chat, email, text messages, social media and online reporting forms. All of these allow us to be connected better than ever before with the public and our core partners.

(Continued on page 2)

IN THIS ISSUE

Weather-Ready Nation: Saving Lives and Livelihoods

Editors

Ken Podrazik
Aubry Bhattarai

Cover photo courtesy of Jim Lee

Impact Based Warnings *by Jeff Johnson, Warning Coordination Meteorologist*

On April 1, 2013, the National Weather Service in Des Moines, IA will start an Impact Based Warnings (IBW) demonstration or test. In 2012, National Weather Service offices in Missouri and eastern Kansas conducted a test project concerning wording contained in National Weather Service tornado and severe thunderstorm warnings. The test was successful to the point where it will be expanded across 11 states, including Iowa, in 2013. The goal of the test is to better communicate threats to partners and the public through changes to warning wording and an expansion of "tags." All changes to tornado and severe thunderstorm warnings will work within the boundaries of well-established weather enterprise infrastructure to ensure easy absorption into mass communication channels.

A significant change will be the expansion of "event tags" at the bottom of tornado and severe thunderstorm warnings. The additional event tags will contain more specific information about threats as a quick means to provide partners with potential high impact risk signals that prompt faster protective actions. Other changes include enhancements to the warning wording to make it easier to identify the most valuable information.

New Warning Tags—Start April 1st!

Tornado Tag:	*Used When:*
TORNADO...RADAR INDICATED	Evidence on radar and near storm environment is supportive of a tornado, but there is no confirmation.
TORNADO...OBSERVED	A tornado is confirmed by spotters or through other means.
Tornado Damage Threat Tag	
NO TAG	Use most of the time, when tornado damage possible within the warning polygon. Tornado duration generally expected to be short-lived.
TORNADO DAMAGE THREAT...CONSIDERABLE	There is credible evidence that a tornado, capable of producing considerable damage, is imminent or ongoing.
TORNADO DAMAGE THREAT...CATASTROPHIC	This is the same as a tornado emergency! A severe threat to human life and catastrophic damage from a tornado is occurring. Only used with a reliable confirmation of a violent tornado.
Tornado Tag in Severe Thunderstorm Warnings	
TORNADO...POSSIBLE	A severe thunderstorm has potential for producing a tornado although forecaster confidence is not high enough to prompt a tornado warning.

DSS Workshop

(Continued from page 1)

Over the past year the NWS has put forth a strategic plan, "Build a Weather-Ready Nation." An overarching goal for this plan is for the NWS to focus on DSS, improve technology for tracking and forecasting storms, expand ways of disseminating information, and increase preparedness for weather events both locally and nationally. To achieve this goal, there are many pilot projects that have been put in place across the NWS over the past year to study their functionality for implementation nationwide in the future. Some of these projects include the development of a national NWS Operations Center and Regional Operations Centers which function similarly to state EOCs in that they take information from around the region/nation and brief high level cabinet member government officials of regional/national hazardous weather situations.

DSS goals for the future also include integrating social science principles into warning systems so that we can better prepare communities and the public for hazardous weather. The NWS will continue to use state-of-the-art technology and science to provide the best services possible. This will include development of digital datasets that can be accessed by all and a shift from specific product-centric mindset to an impact-based mindset when issuing products. Overall the workshop was a success and allowed us to gain a better understanding of what the emergency management community needs from us to better serve their specific entities and how we can all work together to build community resilience to hazardous weather!

Severe Weather Awareness Week 2013 *by Aubry Bhattarai, General Forecaster*

Shelf cloud over Polk County, Iowa in 2012. Courtesy Tom Reis.

Tornado near New Hartford, IA in 2008. Courtesy Rod Donavon.

With spring time right around the corner, we begin to think about longer days and outdoor activities. But spring time also brings another severe weather season to Iowa. To help Iowans prepare for the hazards of spring, the National Weather Service and Iowa Homeland Security and Emergency Management have declared the week of March 25-29 as Severe Weather Awareness Week. Please note this week is earlier than in previous years. The dates have changed to correspond with the state of Nebraska's Severe Weather Awareness Week. Severe Weather Awareness Week is an annual event to remind Iowans that severe weather is part of being in Iowa and that understanding the risks and how to respond can save lives.

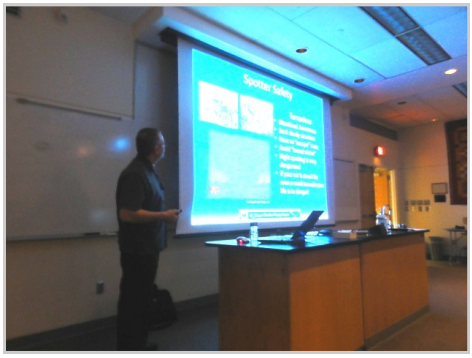
During Severe Weather Awareness Week, the National Weather Service will promote severe weather safety and preparedness by issuing informative Public Information Statements. Daily topics will include flash flooding, receiving warnings, tornadoes, severe thunderstorms and family preparedness. Severe Weather Awareness Week is an excellent time to review your severe weather preparedness plans and to create a preparedness kit. You can find more information about the weather hazards in Iowa on new preparedness pages developed by the National Weather Service Des Moines at: www.weather.gov/dmx/?n=preparedness. You can find additional information at: www.BeReady.Iowa.Gov.

The highlight of the week will be the statewide tornado drill on Wednesday March 27, 2013. This will begin around 10:00 am and conclude by 11:00 am for all 99 Iowa counties. All five Iowa National Weather Service offices which serve Iowa will participate in the drill. Media coverage is vital to the success of Severe Weather Awareness Week and is greatly appreciated. Please contact Jeff Johnson at the National Weather Service Des Moines by e-mail at jeff.johnson@noaa.gov to schedule a flood safety and/or a severe weather preparedness interview, or to partner in preparedness activities or productions.

Spotter Training 2013

by Jeff Johnson, Warning Coordination Meteorologist

The National Weather Service (NWS) and emergency managers will be hosting spotter training classes across central Iowa this spring. This year, there will be a combination of in-person spotter training classes scattered across central Iowa and webinar-based distance learning classes. In-person spotter training classes will be offered in larger cities and towns and in several rural counties and small towns. Every county in the NWS Des Moines County Warning Area will have an in-person spotter training class at least every other year. To supplement in-person training, the NWS will conduct weekly distance learning webinars using the join.me application. All webinars are open to all spotters!



Spotter training in Warren County, IA in 2013.

One advanced spotter class will be offered on April 11. The advanced class will build on what is taught in the regular class. It is intended for those who wish to do mobile spotting and desire a deeper understanding of meso-scale and storm-scale meteorology as it relates to storm spotting. Spotters interested in attending this class should attend a regular spotter class either in-person or by webinar. The advanced presentation will also be offered in webinar form on April 16.

For schedule information and to learn more about how to view a webinar, please visit our news story on our website titled 2013 Spotter Training.

Spotter training in Polk County, IA in 2012.

2013 Spring Flood Outlook

by Jeff Zogg, Senior Service Hydrologist

The risk of flooding this spring is presently near or below average along all streams in the NWS Des Moines service area. The reason for this outlook can be understood by examining the major factors that influence the risk of flooding. Those factors are listed below, along with their current conditions as of March 6, and how each factor contributes to the spring flooding risk.

- **Snow cover.** The snow pack is near or above average for this time of year. The current snow cover conditions may slightly increase the risk of flooding.
- **Soil moisture.** Soil moisture is below average (i.e., at or below the 30th percentile). The driest conditions are in northwest Iowa where values are at or below the 10th percentile. The current soil moisture conditions would tend to lower the risk of flooding.
- **Frost depth.** Ground frost has penetrated much more deeply this year than last year. Frost depths range from around 10 inches in southern Iowa, to 20 or more inches in northern parts of the state. The current frost depth conditions would tend to increase the risk of flooding.
- **River levels.** River levels are generally below or much below average (i.e., 24th percentile or lower). The current river level conditions would tend to decrease the risk of flooding.

Also, "concrete frost" exists across northern Iowa, especially north of U.S. Highway 20. The combination of frozen ground as well as ice in the upper-most layer of the ground has produced this situation. Runoff from snow melt and rainfall will be higher than average until the ground thaws. Thus, the risk of flooding in that region will be higher than average, again until the ground thaws.

The risk of flooding cannot be determined solely by considering the current conditions. We also need to consider the expected conditions going forward, such as precipitation. The precipitation outlook for March through May calls for equal chances of above, near and below average precipitation across much of the NWS Des Moines service area. With the absence of no strong indication regarding precipitation trends, the impact on the risk of flooding is inconclusive. Of course heavy rainfall may lead to localized flooding or flash flooding especially if it falls in the area of "concrete frost" north of U.S. Highway 20.

Finally, it should be noted that ice is prevalent on some streams. If river levels do rise, breakup ice jams may result. Typically breakup ice jams can cause flooding and sometimes flash flooding. With river levels running below average, though, the risk of flooding due to them will be lower than average however.

On March 7, NWS Des Moines issued the second and final spring flood outlook for the season. Refer to the NWS Des Moines Web site at http://www.weather.gov/desmoines for more information.

Wireless Emergency Alerts to Continue for Severe Weather Season

by Aubry Bhattarai, General Forecaster

Throughout the winter season, some people may have experienced receiving National Weather Service warnings on their cell phones. These alerts are Wireless Emergency Alerts (WEA) and select high impact NWS warnings are sent to cell phones. Additional alerts from other government agencies, such as FEMA, may also be sent to your phone. Here is how it works: If you are at home, or traveling in an area where a warning has been issued, your phone will receive alerts broadcast by nearby cell towers. If your phone is enabled to receive alerts, your phone will receive an alert that resembles a text message, the message will be no longer than 90 characters. The alert will have a special tone and vibration, repeated twice, so that you will be able to tell it apart from a regular message. If you receive an alert, you should follow any action advised by the emergency message and seek additional details.

The service is free of charge and messages will not count towards texting or data limits on your wireless plan. It comes enabled on newer cell phones depending on the carrier. WEA messages will continue during the severe weather season, alerting for tornado warnings and flash flood warnings. If you wish to receive these potentially lifesaving messages, check to ensure they are activated on your phone; some people may have deactivated the alerts during the winter season.

For more information about wireless alerts, visit: http://www.crh.noaa.gov/news/display_cmsstory.php?storyid=83063&source=0

On the following page is a list of National Weather Service warnings which will be sent via Warning Emergency Alerts to cell phones. The warning type and sample message are shown.

Warning Type:	CMAS Message:
Tsunami Warning	Tsunami Warning in this area. Avoid coastal areas. Check local media. –NWS
Tornado Warning	Tornado Warning in this area til hh:mm tzT. Take shelter now. –NWS
Extreme Wind Warning	Extreme Wind Warning this area til hh:mm tzT ddd. Take shelter. –NWS
Flash Flood Warning	Flash Flood Warning this area til hh:mm tzT. Avoid Flooded areas. Check local media. –NWS
Hurricane Warning	Hurricane Warning this area til hh:mm tzT ddd. Check local media and authorities. –NWS
Tyhoon Warning	Typhoon Warning this area til hh:mm tzT ddd. Check local media and authorities. –NWS
Blizzard Warning	Blizzard Warning this area til hh:mm tzT ddd. Prepare. Avoid Travel. Check media. –NWS
Ice Storm Warning	Ice Storm Warning this area til hh:mm tzT ddd. Prepare. Avoid Travel. Check media. –NWS
Lake Effect Snow Warning	Lake Effect Snow Warning this area til hh:mm tzT ddd. Avoid Travel. Check media. –NWS
Dust Storm Warning	Dust Storm Warning this area til hh:mm tzT ddd. Avoid travel. Check local media. –NWS

List of National Weather Service warnings which will be sent via Warning Emergency Alerts to cell phones. The warning type and sample message are shown.

Cloud Types Word Search

R	O	O	U	S	U	R	U	C	N	C	A	A	S	S
D	S	U	L	U	M	U	C	O	T	L	A	L	U	S
D	D	U	O	L	C	F	L	E	H	S	R	T	T	I
T	D	S	B	U	T	N	S	T	F	U	A	O	A	L
S	U	L	U	M	U	C	O	T	A	R	T	S	R	S
A	O	M	O	U	I	L	A	N	T	U	R	T	T	W
D	L	A	U	C	S	N	U	S	A	O	F	R	S	A
R	C	U	U	O	U	P	O	U	L	A	A	A	O	V
I	L	O	R	R	D	R	N	L	R	T	C	T	B	E
T	L	S	T	R	R	A	C	D	U	L	U	U	M	C
T	A	S	A	I	L	L	N	S	R	M	M	S	I	L
L	W	F	C	C	O	W	U	R	U	L	U	C	N	O
U	T	C	O	U	O	U	U	O	O	L	L	C	R	U
O	R	T	D	D	M	A	M	M	A	T	U	S	A	D
L	R	O	T	O	T	C	I	R	R	U	S	I	M	E

altocumulus
altostratus
cirrocumulus
cirrostratus
cirrus
cumulonimbus
cumulus
downdraft
mammatus
nimbostratus
roll cloud
shelf cloud
stratus
stratocumulus
tornado
updraft
wall cloud
wave cloud

Answer Key

Fire Weather Products Overview

by Frank Boksa, General Forecaster

As Fire Weather Season ramps up for 2013 I wanted to take a minute to remind everyone of the products the National Weather Service (NWS) issues and what they are intended for.

The Fire Weather Planning Forecast is a product that is issued daily by 6 AM from March 1 through November 15. During peak spring (March 1-June 1) and fall (September 1-November 15) seasons this product is issued twice daily by 6 AM and 4 PM. This product is for decision support for those responsible for planning prescribed burns and to the general public who plans a legal burn on their property. The product is a 7 day forecast with the first 36 hours broken into a tabular format that defines, in 12 hour increments, specific parameters such as relative humidity, precipitation, mixing height, transport winds, the grassland fire danger index as well as the Haines index.

The Fire Weather Watch is a public product that the NWS issues from 24 to 48 hours in advance of whenever there is a reasonable level of confidence that an area will have sustained wind speeds at or above 25 mph along with a minimum relative humidity of 25 percent or less and fuels (grasses and tinder) are sufficiently dry that they will quickly catch fire and/or allow for a fire to spread quickly. The intention of this product is for decision support for those who are in charge of any burning taking place in a county either on private or public land. It should raise a level of concern that any burning could lead to fires that get out of control. In general if a watch is in place, people planning a burn should consider alternative dates.

The Red Flag Warning is a public fire weather warning product that the NWS issues whenever we are expecting wind speeds at or above 25 mph in combination with a relative humidity of 25 percent or less and dry fuels. This product is a warning to people that it is dangerous to burn and burning is not recommended. The Red Flag Warning is issued up to 24 hours in advance of when we expect meteorological conditions and dryness of fuels to create an explosive environment for fires to develop or spread. During a Red Flag Warning event, decision makers in the fire weather community as well as state and county officials may want to consider burn bans or to begin contingency planning for additional staff to handle fires that could quickly get out of control.

For marginal fire weather conditions the NWS may issue a Special Weather Statement. The intent of this product is to convey to the general public that there is a concern for fire danger and that they should remain alert for possible upgrades to a red flag warning.

The Spot Forecast is not a public product. Only people from government agencies or public agencies with a valid contract to do work for a government agency can request a spot forecast.

For information on the 2013 Annual Operating Plan and to view forecasts and fire weather planning tools, please visit our website at:
http://www.crh.noaa.gov/dmx/firewx.php

Employee Spotlight *Kurt Kotenberg, Meteorologist Intern*

Kurt Kotenberg was born and raised in Madison, WI and graduated from Wisconsin-Milwaukee with both a B.S. and a Master's Degree in Atmospheric Sciences. Under the guidance of Dr. Vincent Larson, Kurt co-authored two published papers relating to altocumulus clouds and their radiative properties. At UWM, Kurt played on the Men's Volleyball team for his first two years and went on many a storm chase. After graduating, Kurt spent four years in front of the camera as a broadcast meteorologist at WEAU-TV (NBC Affiliate) in Eau Claire, WI. While Kurt enjoyed being on the TV and radio, he could make a bigger and better impact on serving the public from the National Weather Service. So in 2010, Kurt decided to make the career switch and was hired as a Meteorologist at the National Weather Service forecast office in Midland, Texas. Kurt learned a lot in the two years he spent in Midland, especially about fire weather; since in 2011, over 1 million acres of land were burned in hot, dry west Texas.

Kurt's better half, Erin, made the move from Wisconsin to Texas with him as well. This past June they were married in her hometown of Black River Falls, WI. Erin taught 10th grade World History in Midland and got her teaching license from UW-Eau Claire in Broadfield Social Studies/World History. Kurt and Erin are both beyond excited to have this opportunity to move back up north and are looking forward to enjoying all of the great experiences Iowa has to offer!

Kurt Kotenburg: Latest Addition to the NWS Des Moines Team

2013 Cooperative Observer Length of Service Awards

by Brad Fillbach, Hydro-Meteorological Technician/Cooperative Program Manager

John Beltz (left) of Jefferson, Iowa receives his 15 year length of service award from Jeff Johnson (right) WCM, WFO Des Moines.

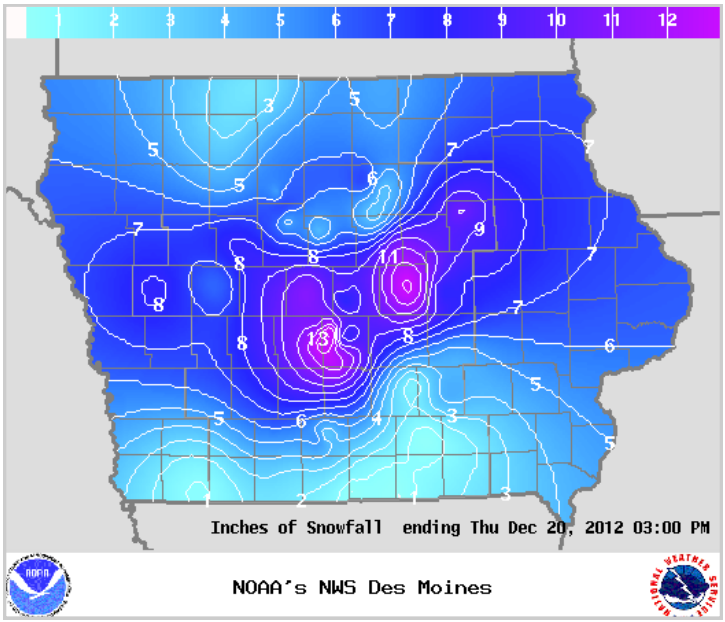
Randy Wheatley of Adair, Iowa receives his 30 year length of service award. Aubry Bhattarai, general forecaster, WFO Des Moines, made the presentation.

Craig Hall (right) of Brooklyn, Iowa receives his 15 year Length of Service award from Chris Southerlin (left), electronics technician, WFO Des Moines.

Jim Lee (left), general forecaster, WFO Des Moines, presents Paul Fobian of New Hartford, IA with his 35 year Length of Service award.

Fun Fact: Des Moines climate statistics comparing 2012 to 2013

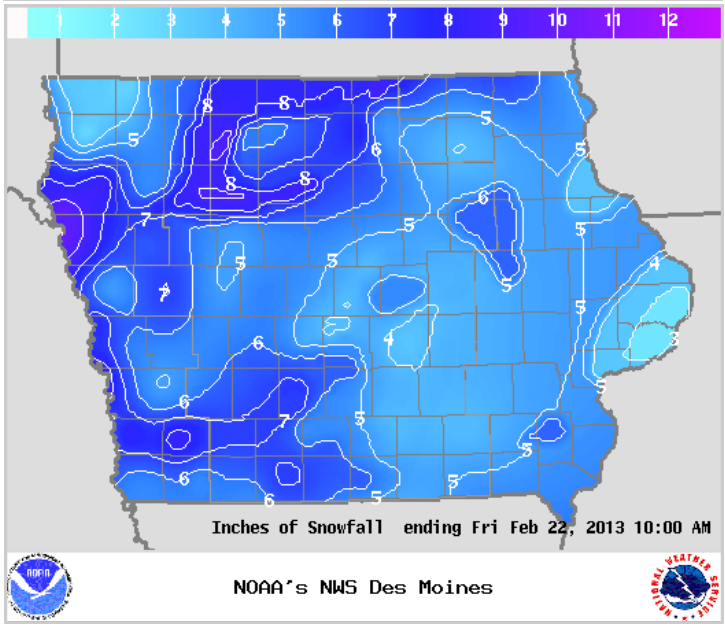
March	2012 High	2013 High	2012 Low	2013 Low	2012 Average	2013 Average
14	81	52	57	28	69	40
15	81	63	45	32	63	48
16	84	39	58	28	71	34
17	83	41	63	23	73	32
18	83	36	62	22	73	29
19	81	41	60	18	71	30



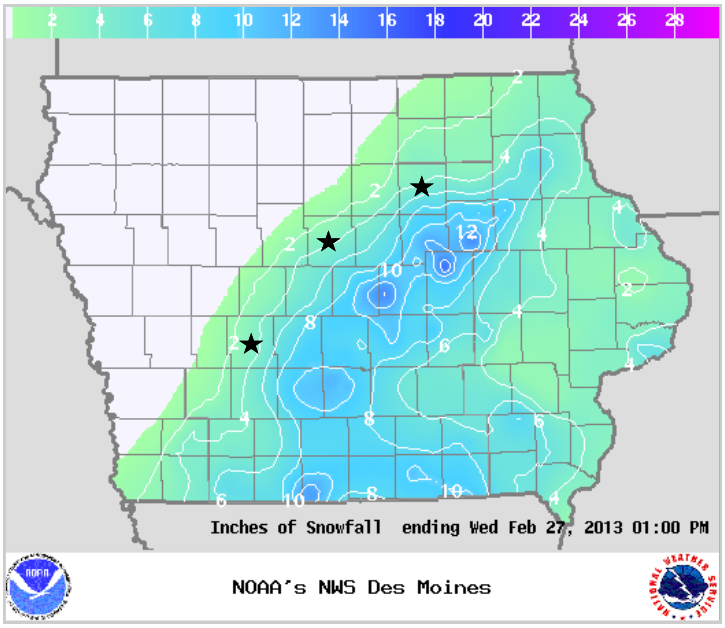
Summary of the 2012-13 Winter Storms

by Ken Podrazik, General Forecaster

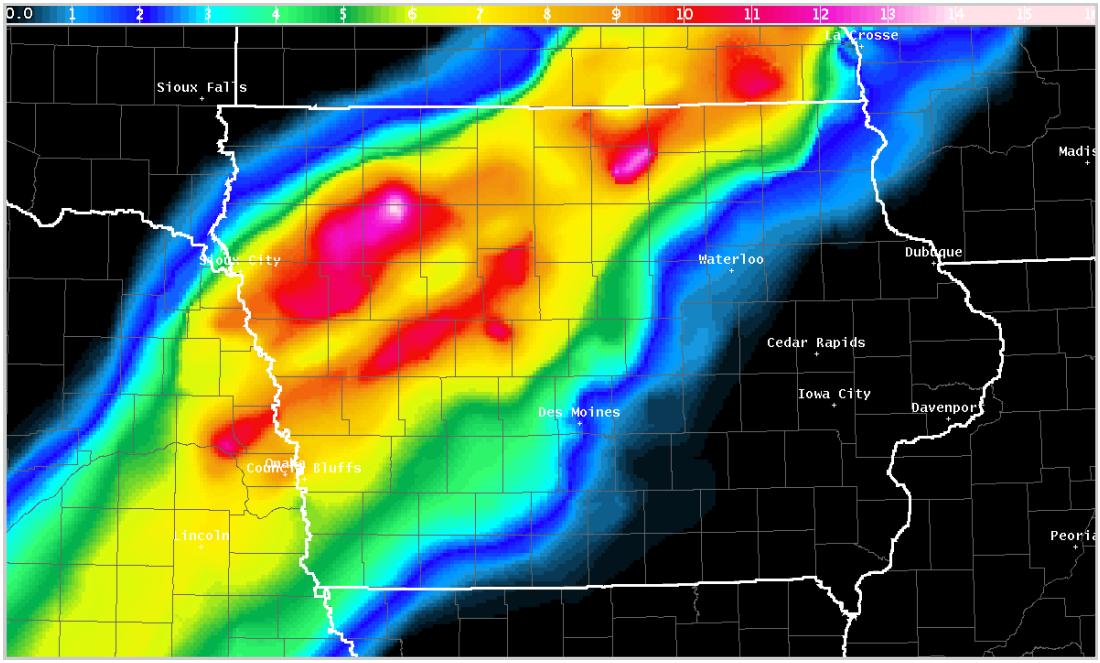
The first major winter storm of the 2012-2013 winter season was a major blizzard that brought several inches of snow across central Iowa on December 19-20, 2012. The heaviest band of snow set up from just southwest of Des Moines and extended northeast through Waterloo. There were several reports of a foot of snow from eastern Dallas County to Polk County northeast into Marshall County. Visibility of less than a quarter mile to even white-out conditions occurred overnight Wednesday night the 19th into Thursday morning on the 20th. Thundersnow was reported at several locations across central Iowa late Wednesday night the 19th. Click image to enlarge.



A much anticipated winter storm on Thursday February 21, 2013, brought anywhere from 5 to 10 inches of snow across much of Iowa, with the heaviest snow band set up across northwest Iowa. Click image to enlarge.



A long duration band of moderate to heavy snow developed over Missouri and shifted northward into Central and Northeast Iowa on February 26, 2012. A very sharp edge from little or no snow accumulations to heavy snow occurred with this storm. There were several counties where the northwest portions received only a trace to 2 inches, while the southeast sections received anywhere from 6 to 10 inches. Guthrie, Hamilton, and Butler Counties are marked with a star indicating the sharp edge of the heaviest snowfall across these counties. Click image to enlarge.



March 10-11, 2013 another band of heavy snow dropped anywhere from 5 to 12 inches across west central to north central Iowa. The heaviest snowfall was located over portions of northwest Iowa where 11 to 14 inches accumulated from Fort Dodge to Cherokee, Iowa. Click image to enlarge.

Climatological Data for November 2012 through February 2013

Location	Month	Average Temp	Departure	Highest	Lowest	Rain / Snow	Departure
Des Moines	Nov	40.9°F	+3.0°F	73°F (9th)	16°F (26th,25th)	2.29" / T	+0.19" / -4.5"
	Dec	23.5°F	-1.4°F	61°F (30th)	1°F (12th)	0.77" / 9.7"	-0.56" / +2.0"
	Jan	18.5°F	-1.9°F	41°F (5th)	-3°F (21st)	1.07" / 12.8"	+0.04" / +4.0"
	Feb	26.7°F	+0.1°F	68°F (17th)	-9°F (8th)	0.77" / 10.3"	-0.42" / +2.1"
Mason City	Nov	34.2°F	+1.4°F	70°F (9th)	11°F (27th,25th)	2.64" / M	+0.68" / M
	Dec	15.5°F	-3.5°F	39°F (30th)	-9°F (13th)	2.67" / M	+1.59" / M
	Jan	10.7°F	-3.2°F	32°F (29th,28th)	-22°F (21st)	1.07" / M	+0.09" / M
	Feb	19.6°F	-1.0°F	56°F (17th)	-15°F (10th,8th)	0.94" / M	+0.02" / M
Waterloo	Nov	36.8°F	+1.7°F	70°F (9th)	13°F (26th)	1.51" / T	-0.59" / -4.8"
	Dec	16.9°F	-4.7°F	43°F (30th)	-14°F (19th)	2.05" / 24.7"	+0.94" / +17.2"
	Jan	13.7°F	-2.4°F	33°F (17th,5th)	-21°F (21st)	1.04" / 13.3"	+0.20" / +5.1"
	Feb	21.7°F	-0.9°F	62°F (17th)	-15°F (10th)	1.72" / 9.2"	+0.67" / +1.9"
Ottumwa	Nov	41.2°F	+1.8°F	72°F (10th,9th)	16°F (26th)	1.10" / M	-1.32" / M
	Dec	23.0°F	-3.6°F	57°F (30th)	-4°F (13th)	0.94" / M	-0.38" / M
	Jan	17.8°F	-4.2°F	39°F (5th)	-7°F (21st)	0.40" / M	-0.60" / M
	Feb	25.6°F	-2.3°F	68°F (17th)	-10°F (3rd)	1.03" / M	-0.13" / M

Iowa Statewide Averages and Rankings for Temperature and Precipitation

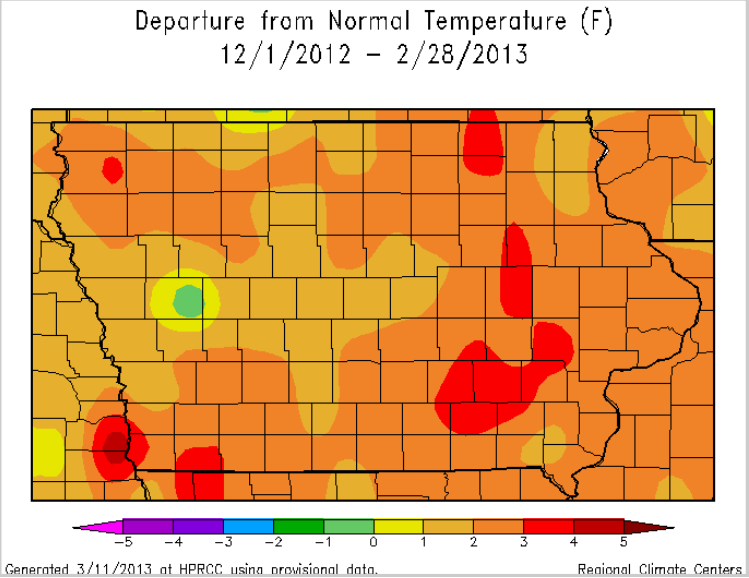
by Craig Cogil, Lead Forecaster

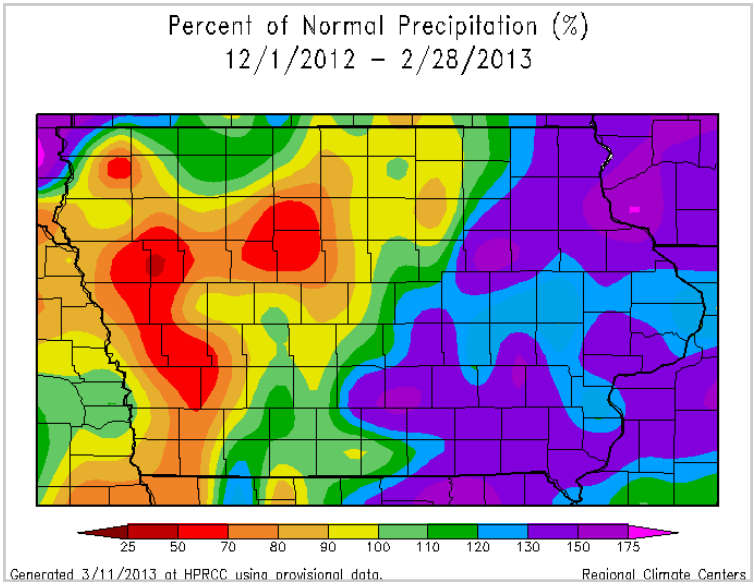
Month	Temperature	Departure from Normal	Rainfall	Departure from Normal	Temperature Ranking	Precipitation Ranking
December 2012	27.6°F	+4.7°F	1.57"	+0.23"	39th Warmest	34th Wettest
January 2013	21.6°F	+2.2°F	0.96"	+0.04"	44th Warmest	66th Wettest
February 2013	23.6°F	-0.4°F	1.31"	+0.26"	66th Warmest	40th Wettest
Winter 2012-2013	24.3°F	+2.2°F	3.84"	+0.53"	41st Warmest	42nd Wettest

Rankings for December are based upon 140 years of records. The January and February numbers cover the past 141 years. All values are preliminary.

Temperatures:

Temperatures during meteorological winter (December-February) were generally above normal for the period. Readings were not nearly as warm or extreme as last winter when seasonal averages were around 6 degrees above normal. However, other than a few bursts of colder air, temperatures were fairly steady above normal for much of the winter. The warmest areas were in far southern and portions of eastern Iowa, which ran from 3 to 4 degrees above normal. Overall, the winter season was 2.2 degrees above normal across Iowa which is the 42nd warmest in the past 140 years.





Precipitation:

Snow and rainfall were quite variable over the state during the winter season with the southeast third of Iowa receiving the most moisture. The south-east portions of the state saw precipitation totals that were in excess of 130 percent of normal with several storms visiting during the winter. While this precipitation is much needed given the ongoing drought, much of the snow and rain ran off into streams and rivers as the ground was frozen. Meanwhile, the northwest half of Iowa struggled to receive as much precipitation allowing the drought to persist in those locations.

Fun Fact: According to the World Meteorological Organization, the world's lowest average yearly precipitation is 0.03 inches during a 59-year period at Arica, Chile. In addition, no rain fell from October 1903 to January 1918. That is more than 14 years without rainfall!

Outlook for Spring into Summer 2013

by Miles Schumacher, Lead Forecaster

Winter of 2012-13 was once again relatively mild, though colder than last winter. Temperatures have been warmer than normal for 17 of the last 18 months. The drought conditions across the central U.S., the most widespread since 1956, were eased somewhat during the late fall and winter months. Above normal precipitation occurred over the southeast half of the state, but dry conditions held strong in the northwest.

The weakening El Niño signal in the equatorial Pacific continued to fade through the winter months. In fact, the average temperature across the equatorial Pacific was slightly below normal through much of the winter. The circled area in figure 1 shows the rather chaotic water temperature pattern. It is neither a clear La Niña (cold) nor El Niño (warm) event. One of the factors that helped to prevent the El Niño that began to develop last summer from continuing into this past winter was the effect of what is known as the Pacific Decadal Oscillation (PDO). We are presently in the cold phase of PDO. The evidence for this is also shown in figure 1 with the horseshoe pattern of cold water along the west coast of North America that sweeps southwest into the equatorial region.

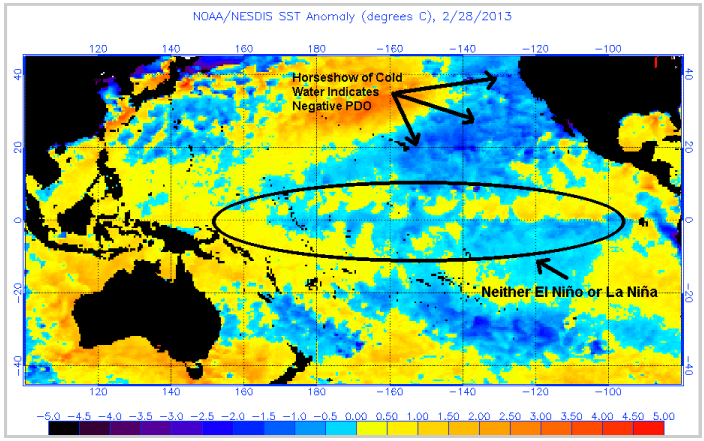


Figure 1: Sea surface temperature departure from normal over the equatorial Pacific.

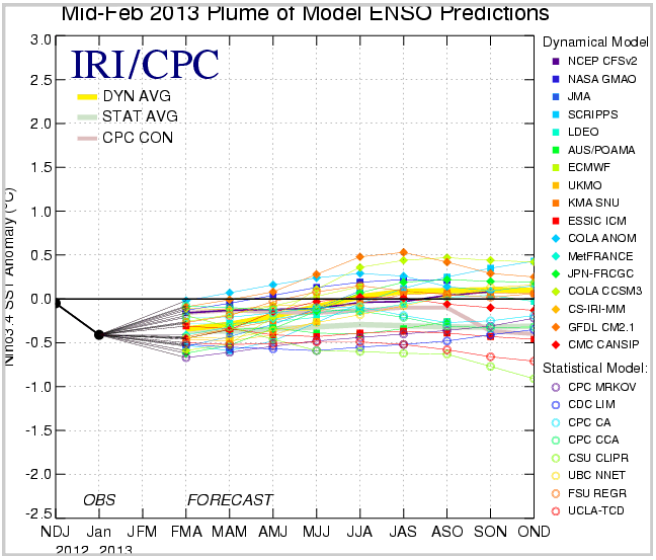


Figure 2: Sea surface temperature departure for the past two 3-month seasons, and the projection into the Fall of 2013. Departure in degrees C is shown on the ordinate, with time on the abscissa.

The atmosphere typically follows a three to seven year cycle between El Niño and La Niña. Depending on the phase of the PDO, El Niño/La Niña is favored during warm/cold phase of the PDO. The Pacific is currently in the cold phase of PDO. La Niña conditions are favored by a two to one margin during the cold phase. For that reason, it is unlikely that there will be a change toward El Niño this spring or summer. The pattern is more typical of what was observed during the last cold phase of the PDO, roughly 1947-1977. Model forecasts suggest we are unlikely to progress into an El Niño pattern during the upcoming summer. In fact, many of the model runs suggest a slight cool pattern will persist. Figure 2 shows the observed central Pacific sea surface temperature departure (solid black line) and a series of 25 forecasts, seventeen of which are based on dynamic models, eight of which are statistically based. The mean forecast from the dynamic models is shown in a wider yellow line; a wider pale blue line depicts the statistical model average. The mauve colored wider line is the Climate Prediction Center consolidation. These forecasts are based on average conditions through the first part of February of 2013. As can be seen in figure 2, the most likely outcome for this spring and summer is slightly cool neutral pattern. To be either an El Niño or La Niña, the average temperature departure must be 0.5°C or more above or below normal respectively for three consecutive 90 day seasons.

Although in meteorology no two years are the same strictly speaking, one can look at weather patterns of the recent past to give some indications of near term weather trends in the future. This forecast is based in large part on the best fit from several of the years that were similar to the winter season just past. Considerations were also made for the state of the Pacific and expected El Niño neutral conditions and other factors that influence our weather pattern. Though there is not a strong correlation with the tendency for cool water in the equatorial Pacific, there are statistical leanings toward dry conditions during the summer months during multi-year cool phases. It is also typical that the year following a significant drought, such as we saw last year, tends to be drier than normal as well. This was the case in the summer of 1957 following the severe drought of 1956.

(Continued on page 12)

Spring/Summer Outlook

(Continued from page 11)

The negative PDO pattern, shown in figure 1, tends to result in the development of upper level low pressure off the west coast of the U.S. during the spring season. The two most notable effects of that are an enhanced chance for cold air to push south into the western U.S. and a better chance for moisture from the Gulf of Mexico to reach Iowa.

With this pattern there is a greater likelihood for the pattern to be more variable with strong shifts between above and below normal temperatures, unlike the persistent warmth that was observed last year. Warmer than normal temperatures are more likely over the southeast U.S., with cooler than normal temperatures over the northwest U.S. Iowa is expected to be in between. Gulf moisture is likely to be drawn north into Iowa with greater than normal precipitation expected over much of the southeast half of the state. See figure 3

The atmosphere is expected respond to the overall neutral Pacific Ocean temperatures. Perhaps a stronger driver as we move into the summer months will be the antecedent soil moisture. With the drought conditions as severe as they were last summer, and with only minor recovery through the winter months, there will be an enhanced probability of warmer than normal temperatures. Some improvement is expected to take place during the spring. Drought conditions will likely persist through the summer, however not as severe as they were in the summer of 2012. For the summer, temperatures are most likely to average above normal across the state. Although the number of days above 90 degrees is likely to be less than in the summer of 2012, Iowa is likely to have about 150% of the normal number. Rainfall across the state is also expected to be less than normal. Indications are that July may be well have the greatest departure in both temperature and rainfall, making it a hot and dry month with the potential of rainfall being 50% short of normal. Indications for dry weather in June and August are not as strong. From statistical analysis of years similar to 2012 into early 2013, indications are that the summer will be warmer and drier than normal but not as intense as last year. See figure 4 for details.

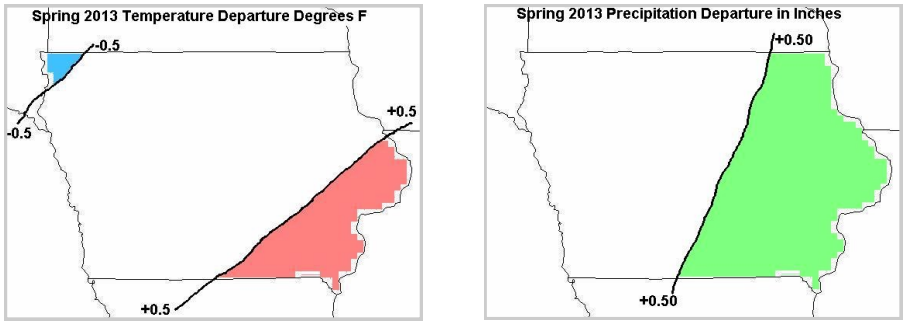


Figure 3: Mean Temperature (left) and Precipitation (right) departure for March through April.

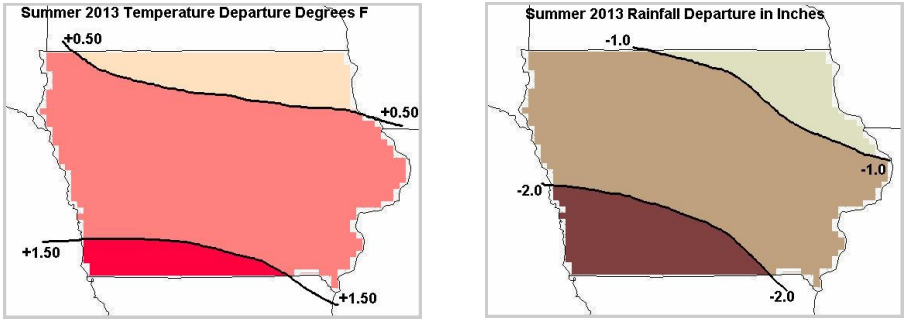


Figure 4: Mean Temperature (left) and Precipitation (right) departure forecast for June through August.

It will be important to monitor the oceanic and atmospheric patterns over the next several months. Although precipitation this spring is most likely to be normal to above, it is not likely to completely recharge the soil moisture to relieve the extremely dry conditions of the northwest. Some improvement is expected however, especially over the east. Warmer than normal temperatures this summer will put additional stress on water resources.

These outlooks are based more heavily on statistics than many of the methods used by the Climate Prediction Center. The complete set of official forecasts from the Climate Prediction Center can be found on our website.

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